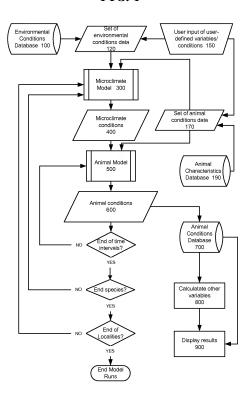
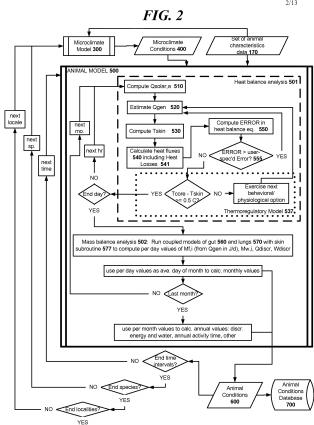
Replacement Sheet 1/13

**FIG.** 1



Replacement Sheet



End Model Runs

Qconv

Qevapares:

 $r + \Delta r$ 

Qevap,skin

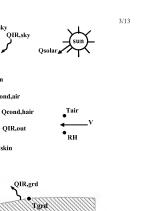
QIR,in Ocond,air

QIR,out

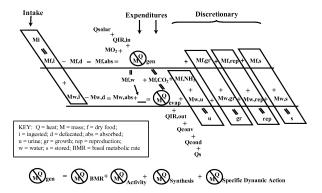
FIG. 3a

Qcond,grd

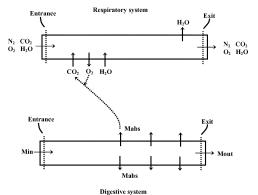
fur/feather



## FIG. 3b



## FIG 4



## FIG. 5a

VARIABLE	DEFINITION
abs	Absorbed (unless otherwise noted).
ABSAN	Animal absorptivity.
ABSSB	The absorptivity of the substrate.
ashade	Percent shade on the animal.
ASILN	Silhouette area normal to the sun.
B1ARA(1)	A variable that indicates the optical thickness of the fur or feathers; it is
	the exponent of Beer's Law ( <i>i.e.</i> the extinction coefficient ( $\tau$ )times the depth of fur/feathers (t)).
BETARA(2)	The IR extinction coefficient of fur/feathers.
BICV	A dimensionless variable for convection heat transfer.
BIR	A dimensionless variable for IR heat transfer.
CIN	Is C1 normalized; a dimensionless variable.
d	Defecated
D1	D1 is a dimensionless variable.
DigEff	Digestive efficiency.
dir	Direct.
discr	Discretionary.
EMIS	The emissivity of the animal.
evap	Evaporated.
f	Food (dry food).
Fa,grd	The configuration factor between the animal and the ground.
Fa,sky	The configuration factor between the animal and the sky.
Fabush	The configuration factor between the animal and the nearby object.
g	The heat generation per unit volume.
gfatpg,	The grams of fat, protein, and carbohydrate per gram dry mass of food.
gprotpg,	
gcarbpg	
gr	Growth.
grd	Ground or other surface.
gundig	Undigested mass per gram dry mass of food.

## FIG. 5b

HC HC is the convection heat transfer coefficient. hor Horizontal to. HR is the radiant heat transfer coefficient.  i Ingested. IR Infrared. Jabspgr Joules absorbed per gram of dry food. K Thermal conductivity for tissue. KEFAR KEFAR is the effective thermal conductivity of fibers and air for conduction.  KRADSKY/ GRD/BUSH M Mass. Mass. Mass. Mass. Miser Total discretionary mass; Mw,diser + Mf,diser. met Metabolism. Mf,a Mass of food absorbed. Mf,di Mass of food defecated. Mf,digr Discretionary mass from food; Mf,gr + Mf,rep + Mf,s. Mf,gr Discretionary mass from food available for growth. Mf,nem Mass of food ingested. Mf,rep Discretionary mass from food stored. Mf,rep Discretionary mass from food stored. Mf,s Discretionary mass from food stored. Mf,w, Mass of water in food absorbed (Mf,a). Mw,a Mass of water absorbed. Mw,d Mass of water absorbed. Mw,discr Total discretionary mass from water available for growth. Mw,gr Discretionary mass from water available for reproduction. Mw,s Discretionary mass from water stored. Mw,u Mass of water caccreted in urine. n Geometry constant (varies with shape).	gw	Grams water.
HR HR is the radiant heat transfer coefficient.  i Ingested.  Jabspgr Joules absorbed per gram of dry food.  K Thermal conductivity for tissue.  KEFAR KEFAR is the effective thermal conductivity of fibers and air for conduction.  KRADSKY/ GRD/BUSH  M Mass.  Mdiscr Total discretionary mass; Mw,discr + Mf,discr.  met Metabolism.  Mf,a Mass of food absorbed.  Mf,d Mass of food defecated.  Mf,discr Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s.  Mf,gr Discretionary mass from food available for growth.  Mf,met Mass of food ingested.  Mf,met Mass of food metabolized.  Mf,met Mass of food metabolized.  Mf,rep Discretionary mass from food available for reproduction.  Mf,sp Discretionary mass from food available for reproduction.  Mf,w Mass of water in food absorbed (Mf,a).  Mw,a Mass of water defecated in feces.  Mw,discr Total discretionary mass from water available for growth.  Mg,w Mass of water defecated in feces.  Mw,d Mass of water infood absorbed.  Mw,d Mass of water ingested.  Mw,d Mass of water available for growth.  Mw,i Mass of water ingested.  Mw,rep Discretionary mass from water available for growth.  Mw,rep Discretionary mass from water available for growth.  Mw,rep Discretionary mass from water available for growth.  Mw,a Mass of water metabolized.  Mw,rep Discretionary mass from water available for growth.  Mw,a Mass of water metabolized.  Mw,rep Discretionary mass from water available for reproduction.  My,s Discretionary mass from water available for reproduction.		HC is the convection heat transfer coefficient.
i Ingested. IR Infrared. Jabspgr Joules absorbed per gram of dry food. K Thermal conductivity for tissue. KEFAR KEFAR is the effective thermal conductivity of fibers and air for conduction. The fur/feather radiant conductivity in the sky/ground/bush direction. GRADSKY/GRD/BUSH M Mss. Mdiser Total discretionary mass; Mw,diser + Mf,diser. met Metabolism. Mf,a Mass of food absorbed. Mf,di Mass of food dabsorbed. Mf,digr Discretionary mass from food; Mf,gr + Mf,rep + Mf,s. Mf,gr Discretionary mass from food available for growth. Mf,i Mass of food ingested. Mf,met Mass of food metabolized. Mf,rep Discretionary mass from food available for reproduction. Mf,s Discretionary mass from food stored. Mf,w Mass of water in food absorbed (Mf,a). Mw,a Mass of water absorbed. Mw,d Mass of water defecated in feces. Mw,discr Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s). Mw,gr Discretionary mass from water available for growth. Mw,i Mass of water in food absorbed. Mw,di Mass of water defecated in feces. Mw,discr Total discretionary mass from water available for growth. Mw,i Mass of water ingested. Mw,mer Mass of water mass from water available for growth. Mw,i Mass of water mass from water available for growth. Mw,i Mass of water mass from water available for growth. Mw,i Mass of water mass from water available for growth. Mw,mep Discretionary mass from water available for growth. Mw,a Mass of water restabolized. Mw,rep Discretionary mass from water available for reproduction. My,s Discretionary mass from water stored. Mw,a Mass of water rectabolized in urine.  n Geometry constant (varies with shape).	hor	Horizontal to.
IR Infrared. Jabspgr Joules absorbed per gram of dry food.  K Thermal conductivity for tissue.  KEFAR KEFAR is the effective thermal conductivity of fibers and air for conduction.  KRADSKY/ GRD/BUSH  M Mass.  Midiser Total discretionary mass; Mw,diser + Mf,diser.  met Metabolism.  Mf,a Mass of food absorbed.  Mf,di Mass of food defecated.  Mf,diser Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s.  Mf,gr Discretionary mass from food available for growth.  Mf,i Mass of food ingested.  Mf,rep Discretionary mass from food available for reproduction.  Mf,s Discretionary mass from food available for reproduction.  Mf,w Mass of water in food absorbed (Mf,a).  Mw,a Mass of water defecated in feces.  Mw,di Mass of water defecated in feces.  Mw,gr Discretionary mass from water (Mw,gr + Mw,rep + Mw,s).  Mw,gr Discretionary mass from water available for growth.  Mw,i Mass of water mass from water available for growth.  Mw,i Mass of water defecated in feces.  Mw,di Mass of water mass from water available for growth.  Mw,i Mass of water mass from water available for growth.  Mw,i Mass of water mass from water available for growth.  Mw,i Mass of water mass from water available for growth.  Mw,i Mass of water mass from water available for growth.  Mw,net Mass of water mass from water available for growth.  Mw,net Mass of water mass from water available for reproduction.  Mw,s Discretionary mass from water available for reproduction.  Mw,s Discretionary mass from water available for reproduction.  Mw,s Discretionary mass from water stored.  Mw,u Mass of water recreted in urine.  n Geometry constant (varies with shape).	HR	HR is the radiant heat transfer coefficient.
Jabspgr Joules absorbed per gram of dry food.  K Thermal conductivity for tissue.  KEFAR KEFAR is the effective thermal conductivity of fibers and air for conduction.  KRADSKY/ GRD/BUSH  M Mass.  Mdiscr Total discretionary mass; Mw,discr + Mf,discr.  met Metabolism.  Mf,a Mass of food absorbed.  Mf,d Mass of food defecated.  Mf,discr Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s.  Mf,gr Discretionary mass from food available for growth.  Mf,i Mass of food ingested.  Mf,rep Discretionary mass from food available for reproduction.  Mf,rep Discretionary mass from food available for reproduction.  Mf,w Mass of water in food absorbed (Mf,a).  Mw,a Mass of water defecated in feces.  Mw,discr Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s).  Mw,gr Discretionary mass from food tored.  Mf,w Mass of water absorbed.  Mw,d Mass of water defecated in feces.  Mw,discr Total discretionary mass from water available for growth.  Mw,i Mass of water ingested.  Mw,rep Discretionary mass from water available for growth.  Mw,a Mass of water metabolized.	i	Ingested.
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conduction.  KRADSKY/ GRD/BUSH  M Mass.  Mdiscr Total discretionary mass; Mw,discr + Mf,discr.  met Metabolism.  Mf,a Mass of food absorbed.  Mf,discr Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s.  Mf,d Mass of food defecated.  Mf,discr Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s.  Mf,gr Discretionary mass from food available for growth.  Mf,i Mass of food ingested.  Mf,met Mass of food metabolized.  Mf,rep Discretionary mass from food available for reproduction.  Mf,s Discretionary mass from food available for reproduction.  Mf,w Mass of water in food absorbed (Mf,a).  Mw,a Mass of water defecated in feces.  Mw,discr Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s).  Mw,gr Discretionary mass from water available for growth.  Mw,i Mass of water in food absorbed.  Mw,i Mass of water defecated in feces.  Mw,discr Discretionary mass from water available for growth.  Mw,i Mass of water ingested.  Mw,rep Discretionary mass from water available for reproduction.  Mw,rep Discretionary mass from water available for reproduction.  Mw,s Discretionary mass from water stored.  Mw,u Mass of water excreted in urine.  n Geometry constant (varies with shape).	K	Thermal conductivity for tissue.
GRD/BUSH  M Mass.  Mdiser Total discretionary mass; Mw,diser + Mf,diser.  met Metabolism.  Mf,a Mass of food absorbed.  Mf,did Mass of food defecated.  Mf,diser Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s.  Mf,gr Discretionary mass from food available for growth.  Mf,i Mass of food ingested.  Mf,rep Discretionary mass from food available for reproduction.  Mf,se Discretionary mass from food available for reproduction.  Mf,se Discretionary mass from food available for reproduction.  Mf,w Mass of water in food absorbed (Mf,a).  Mw,a Mass of water absorbed.  Mw,d Mass of water defecated in feces.  Mw,discretionary mass from water (Mw,gr + Mw,rep + Mw,s).  Mw,gr Discretionary mass from water available for growth.  Mw,i Mass of water in food absorbed.  Mw,i Mass of water mass from water available for growth.  Mw,i Mass of water water defecated in feces.  Mw,merp Discretionary mass from water available for growth.  Mw,rep Discretionary mass from water available for reproduction.  Mw,s Discretionary mass from water available for reproduction.  Mw,s Discretionary mass from water stored.  Mw,u Mass of water excreted in urine.  n Geometry constant (varies with shape).	KEFAR	
Mdiscr Total discretionary mass; Mw,discr + Mf,discr.  met Metabolism. Mf,a Mass of food absorbed. Mf,d Mass of food defecated. Mf,discr Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s. Mf,gr Discretionary mass from food available for growth. Mf,i Mass of food ingested. Mf,met Mass of food metabolized. Mf,rep Discretionary mass from food available for reproduction. Mf,rep Discretionary mass from food available for reproduction. Mf,w Mass of water in food absorbed (Mf,a). Mw,a Mass of water in food absorbed (Mf,a). Mw,d Mass of water defecated in feces. Mw,discr Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s). Mw,gr Discretionary mass from water available for growth. Mw,i Mass of water ingested. Mw,met Mass of water ingested. Mw,rep Discretionary mass from water available for reproduction. Mw,s Discretionary mass from water available for reproduction. Mw,s Discretionary mass from water available for reproduction. Mw,s Discretionary mass from water stored. Mw,u Mass of water excreted in urine. n Geometry constant (varies with shape).		The fur/feather radiant conductivity in the sky/ground/bush direction.
met Metabolism.  Mf,a Mass of food absorbed.  Mf,di Mass of food defecated.  Mf,discr Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s.  Mf,gr Discretionary mass from food available for growth.  Mf,i Mass of food ingested.  Mf,rep Discretionary mass from food available for reproduction.  Mf,s Discretionary mass from food available for reproduction.  Mf,s Discretionary mass from food available for reproduction.  Mf,w Mass of water in food absorbed (Mf,a).  Mw,a Mass of water defecated in feces.  Mw,di Mass of water defecated in feces.  Mw,di Mass of water mass from water (Mw,gr + Mw,rep + Mw,s).  Mw,gr Discretionary mass from water available for growth.  Mw,i Mass of water ingested.  Mw,met Mass of water mass from water available for reproduction.  Mw,rep Discretionary mass from water available for reproduction.  Mw,s Discretionary mass from water available for reproduction.  Mw,s Discretionary mass from water stored.  Mw,u Mass of water excreted in urine.  n Geometry constant (varies with shape).	M	Mass.
Mf,a Mass of food absorbed.  Mf,d Mass of food defecated.  Mf,discr Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s.  Mf,gr Discretionary mass from food available for growth.  Mf,i Mass of food ingested.  Mf,met Mass of food metabolized.  Mf,rep Discretionary mass from food available for reproduction.  Mf,s Discretionary mass from food available for reproduction.  Mf,w Mass of water in food absorbed (Mf,a).  Mw,a Mass of water absorbed.  Mw,d Mass of water defecated in fees.  Mw,discr Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s).  Mw,gr Discretionary mass from water available for growth.  Mw,i Mass of water ingested.  Mw,met Mass of water metabolized.  Mw,rep Discretionary mass from water available for reproduction.  Mw,s Discretionary mass from water stored.  Mw,u Mass of water excreted in urine.  n Geometry constant (varies with shape).	Mdiscr	Total discretionary mass; Mw,discr + Mf,discr.
Mf,d Mass of food defecated. Mf,discr Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s. Mf,gr Discretionary mass from food available for growth. Mf,i Mass of food ingested. Mf,met Mass of food metabolized. Mf,rep Discretionary mass from food available for reproduction. Mf,s Discretionary mass from food available for reproduction. Mf,w Mass of water in food absorbed (Mf,a). Mw,a Mass of water in food absorbed (Mf,a). Mw,d Mass of water defecated in feces. Mw,discr Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s). Mw,gr Discretionary mass from water available for growth. Mw,i Mass of water metabolized. Mw,rep Discretionary mass from water available for reproduction. Mw,s Discretionary mass from water available for reproduction. Mw,s Discretionary mass from water available for reproduction. Mw,s Discretionary mass from water stored. Mw,u Mass of water cycled in urine. n Geometry constant (varies with shape).	met	Metabolism.
Mf,discr         Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s.           Mf,gr         Discretionary mass from food available for growth.           Mf,i         Mass of food ingested.           Mf,met         Mass of food metabolized.           Mf,rep         Discretionary mass from food available for reproduction.           Mf,s         Discretionary mass from food stored.           Mf,w         Mass of water in food absorbed (Mf,a).           Mw,a         Mass of water absorbed.           Mw,di         Mass of water defecated in feces.           Mw,discr         Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s).           Mw,gr         Discretionary mass from water available for growth.           Mw,i         Mass of water metabolized.           Mw,met         Mass of water metabolized.           Mw,rep         Discretionary mass from water available for reproduction.           Mw,s         Discretionary mass from water stored.           Mw,u         Mass of water excreted in urine.           n         Geometry constant (varies with shape).	Mf,a	Mass of food absorbed.
Mf.gr Discretionary mass from food available for growth. Mf.i Mass of food ingested. Mf.met Mass of food metabolized. Mf.rep Discretionary mass from food available for reproduction. Mf.s Discretionary mass from food stored. Mf.w Mass of water in food absorbed (Mf.a). Mw.a Mass of water absorbed. Mw.d Mass of water defecated in feces. Mw.discr Total discretionary mass from water (Mw.gr + Mw.rep + Mw.s). Mw.gr Discretionary mass from water available for growth. Mw.i Mass of water ingested. Mw.met Mass of water metabolized. Mw.rep Discretionary mass from water available for reproduction. Mw.s Discretionary mass from water available for reproduction. Mw.s Discretionary mass from water available for reproduction. Mw.s Discretionary mass from water stored. Mw.y Mass of water excreted in urine. n Geometry constant (varies with shape).	Mf,d	Mass of food defecated.
Mf,i         Mass of food ingested.           Mf,met         Mass of food metabolized.           Mf,rep         Discretionary mass from food available for reproduction.           Mf,s         Discretionary mass from food stored.           Mf,w         Mass of water in food absorbed (Mf,a).           Mw,a         Mass of water absorbed.           Mw,discr         Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s).           Mw,gr         Discretionary mass from water available for growth.           Mw,i         Mass of water metabolized.           Mw,rep         Discretionary mass from water available for reproduction.           Mw,s         Discretionary mass from water stored.           Mw,a         Mass of water excreted in urine.           n         Geometry constant (varies with shape).	Mf,discr	Total discretionary mass from food; Mf,gr + Mf,rep + Mf,s.
Mf,met         Mass of food metabolized.           Mf,rep         Discretionary mass from food available for reproduction.           Mf,s         Discretionary mass from food stored.           Mf,w         Mass of water in food absorbed (Mf,a).           Mw,a         Mass of water absorbed.           Mw,discr         Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s).           Mw,gr         Discretionary mass from water available for growth.           Mw,i         Mass of water ingested.           Mw,met         Mass of water metabolized.           Mw,rep         Discretionary mass from water available for reproduction.           Mw,s         Discretionary mass from water stored.           Mw,a         Mass of water excreted in urine.           n         Geometry constant (varies with shape).	Mf,gr	Discretionary mass from food available for growth.
Mf,rep Discretionary mass from food available for reproduction. Mf,s Discretionary mass from food stored. Mf,w Mass of water in food absorbed (Mf,a). Mw,a Mass of water absorbed. Mw,d Mass of water defecated in feces. Mw,discr Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s). Mw,gr Discretionary mass from water available for growth. Mw,i Mass of water ingested. Mw,met Mass of water metabolized. Mw,rep Discretionary mass from water available for reproduction. Mw,s Discretionary mass from water available for reproduction. Mw,s Discretionary mass from water stored. Mw,u Mass of water excreted in urine. n Geometry constant (varies with shape).	Mf,i	Mass of food ingested.
Mf,s         Discretionary mass from food stored.           Mf,w         Mass of water in food absorbed (Mf,a).           Mw,a         Mass of water absorbed.           Mw,d         Mass of water defecated in feces.           Mw,diser         Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s).           Mw,gr         Discretionary mass from water available for growth.           Mw,i         Mass of water ingested.           Mw,met         Mass of water metabolized.           Mw,rep         Discretionary mass from water available for reproduction.           Mw,s         Discretionary mass from water stored.           Mw,u         Mass of water excreted in urine.           n         Geometry constant (varies with shape).	Mf,met	
Mf,w         Mass of water in food absorbed (Mf,a).           Mw,a         Mass of water absorbed.           Mw,d         Mass of water defecated in feces.           Mw,discr         Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s).           Mw,gr         Discretionary mass from water available for growth.           Mw,i         Mass of water ingested.           Mw,rep         Discretionary mass from water available for reproduction.           Mw,rep         Discretionary mass from water stored.           Mw,a         Mass of water excreted in urine.           n         Geometry constant (varies with shape).	Mf,rep	Discretionary mass from food available for reproduction.
Mw,a         Mass of water absorbed.           Mw,d         Mass of water defecated in feees.           Mw,discr         Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s).           Mw,gr         Discretionary mass from water available for growth.           Mw,i         Mass of water ingested.           Mw,met         Mass of water metabolized.           Mw,rep         Discretionary mass from water available for reproduction.           Mw,s         Discretionary mass from water stored.           Mw,u         Mass of water excreted in urine.           n         Geometry constant (varies with shape).	Mf,s	Discretionary mass from food stored.
Mw,d         Mass of water defecated in feces.           Mw,discr         Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s).           Mw,gr         Discretionary mass from water available for growth.           Mw,i         Mass of water ingested.           Mw,met         Mass of water metabolized.           Mw,rep         Discretionary mass from water available for reproduction.           Mw,s         Discretionary mass from water stored.           Mw,u         Mass of water excreted in urine.           n         Geometry constant (varies with shape).	Mf,w	Mass of water in food absorbed (Mf,a).
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Mw.gr         Discretionary mass from water available for growth.           Mw,i         Mass of water ingested.           Mw,met         Mass of water metabolized.           Mw,rep         Discretionary mass from water available for reproduction.           Mw,s         Discretionary mass from water stored.           Mw,u         Mass of water excreted in urine.           n         Geometry constant (varies with shape).	Mw,d	Mass of water defecated in feces.
Mw,i     Mass of water ingested.       Mw,met     Mass of water metabolized.       Mw,rep     Discretionary mass from water available for reproduction.       Mw,s     Discretionary mass from water stored.       Mw,u     Mass of water excreted in urine.       n     Geometry constant (varies with shape).	Mw,discr	Total discretionary mass from water (Mw,gr + Mw,rep + Mw,s).
Mw,met         Mass of water metabolized.           Mw,rep         Discretionary mass from water available for reproduction.           Mw,s         Discretionary mass from water stored.           Mw,u         Mass of water excreted in urine.           n         Geometry constant (varies with shape).	Mw,gr	Discretionary mass from water available for growth.
Mw,rep         Discretionary mass from water available for reproduction.           Mw,s         Discretionary mass from water stored.           Mw,u         Mass of water excreted in urine.           n         Geometry constant (varies with shape).	Mw,i	Mass of water ingested.
Mw,s     Discretionary mass from water stored.       Mw,u     Mass of water excreted in urine.       n     Geometry constant (varies with shape).	Mw,met	
Mw.u Mass of water excreted in urine.  n Geometry constant (varies with shape).	Mw,rep	Discretionary mass from water available for reproduction.
n Geometry constant (varies with shape).	Mw,s	
	Mw,u	Mass of water excreted in urine.
norm Normal to.	n	
	norm	Normal to.

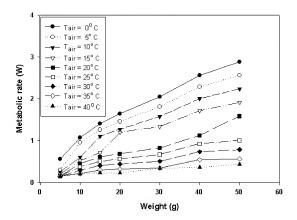
## FIG. 5c

Percent diffuse solar radiation.
User specified percentages of these components of food - fat, protein,
carbohydrates.
PSI is a correction factor.
Heat.
Conduction (via air and fur/feathers) from dorsal and ventral sides of
animal.
Conduction via the air.
Conduction via the fur/feathers.
Convection at the fur-air interface.
Discretionary energy available to the animal.
Amount of energy absorbed on the top/dorsal parts of animal.
Energy loss by evaporation in respiration.
Energy loss by evaporation at skin.
Energy flux via the fur/feathers.
The metabolic heat generation needed to maintain the animal's core
temperature.
the amount of heat entering the animal from external sources (Qsolar,a,
QIR,in, QIR,sky, QIR,grd, other sources).
The IR fluxes from above the animal.
The IR fluxes from below the animal.
IR fluxes from the ground (or other surface).
IR radiation emitted inward through the porous insulation.
IR radiation emitted outward from the fiber elements toward the sky
IR fluxes from the sky.
IR fluxes from vegetation.
Uniform heat generation.
Net heat exchange for the whole animal.
Total solar radiation incident on a surface normal to the sun's direct
beam.
the amount of heat leaving the animal to the environment.
The incoming solar IR radiation from the sky/ground/bush through the
porous media.
Uniform heat dissipation by respiration.
The total amount of diffuse solar radiation.

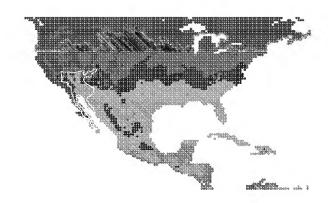
## FIG. 5d

OCODI	T
QSOBJ	Incoming diffuse radiation reflected by an object nearby.
Qsolar	Clear sky solar radiation.
Qsolar,a	Amount of solar radiation (watts) absorbed by the animal.
Qsolar,dir	Direct beam solar radiation.
Qsolar,hor	The incoming solar radiation on a horizontal surface.
QSRSB	The incoming solar radiation reflected from the substrate (i.e. ground
	or other substrate).
QSSKY	The diffuse solar radiation from the sky (i.e. solar radiation scattered
	by molecules in the atmosphere and by clouds).
Qventr	Amount of energy absorbed on the bottom/ventral parts of animal.
R	Radius of animal.
Rep	Reproduction.
resp	Respiration.
RH	Relative humidity of air passing over the animal at its average height
	above ground.
RQ	Respiratory quotient
S	Stored.
sig	The Stefan-Boltzmann constant.
Tair	Air temperature at animal's average height.
Tair,2m	Temperature of air at 2 m height.
TAVsky/grd/	Sky/ground/bush portions of radiant heat exchange (degrees K).
bush	
Tgrd	Ground/surface temperature.
Tgrd(i)	The ground temperature at location (i).
Timbas	Basal multiplier (i.e. activity above resting).
TK	Temperature at degrees Kelvin.
TKair,TKskin,	The temperatures of air, skin, sky, bush, respectively, in degrees K.
TKsky, TKbush	
TOTCARB	Total carbohydrates.
TotJpgram	Joules per gram dry food.
Tskin	The skin temperature of the animal.
Tsky	Clear sky radiant temperature.
Tveg	Temperature of vegetation (or other objects) overhead of the animal.
U	Urine.
V	Velocity of air passing over the animal at its average height above
	ground.
w	Water.
Mw,evap	Mass of water lost by evaporation (Mw,evap,resp + Mw,evap,skin).
Mw,evap,resp	Water loss by evaporation in respiration.
Mw,evap,skin	Water loss by evaporation at skin.
ZFURAR	ZFURAR is the depth of fur.

# FIG. 6



## **FIG.** 7

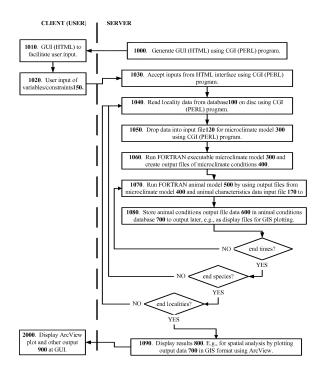


#### Degree days at 10 cm depth:

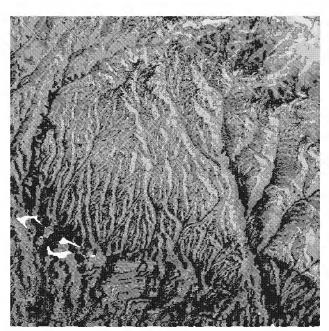
- 0 852852 - 1704
- 1705 2556
- 2557 3408
- 3409 4260
- 4261 5112
- 5113 5964
- 5965 6816
- 6817 7668
- 7669 8520

Replacement Drawing 11/13

### FIG. 8



## FIG. 9



Discretionary energy in July as a function of slope and aspect of topography for Mountain Lion (kJ/d)

13298 -18751

11165 - 11755

9736 - 10644

11755 - 13298

10644 - 11165

FIG. 10

